

PSOCOPTERA FROM NESTS OF THE COLONIAL SPIDER *Ixeuticus candidus* (KOCH) (DICTYNIDAE) IN WESTERN VICTORIA

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Abstract

Psocoptera frequenting nests of *Ixeuticus candidus* collected in August 1973 are listed and discussed. A new species of Pachytroctidae, *Tapinella candida* sp.n. is described and illustrated.

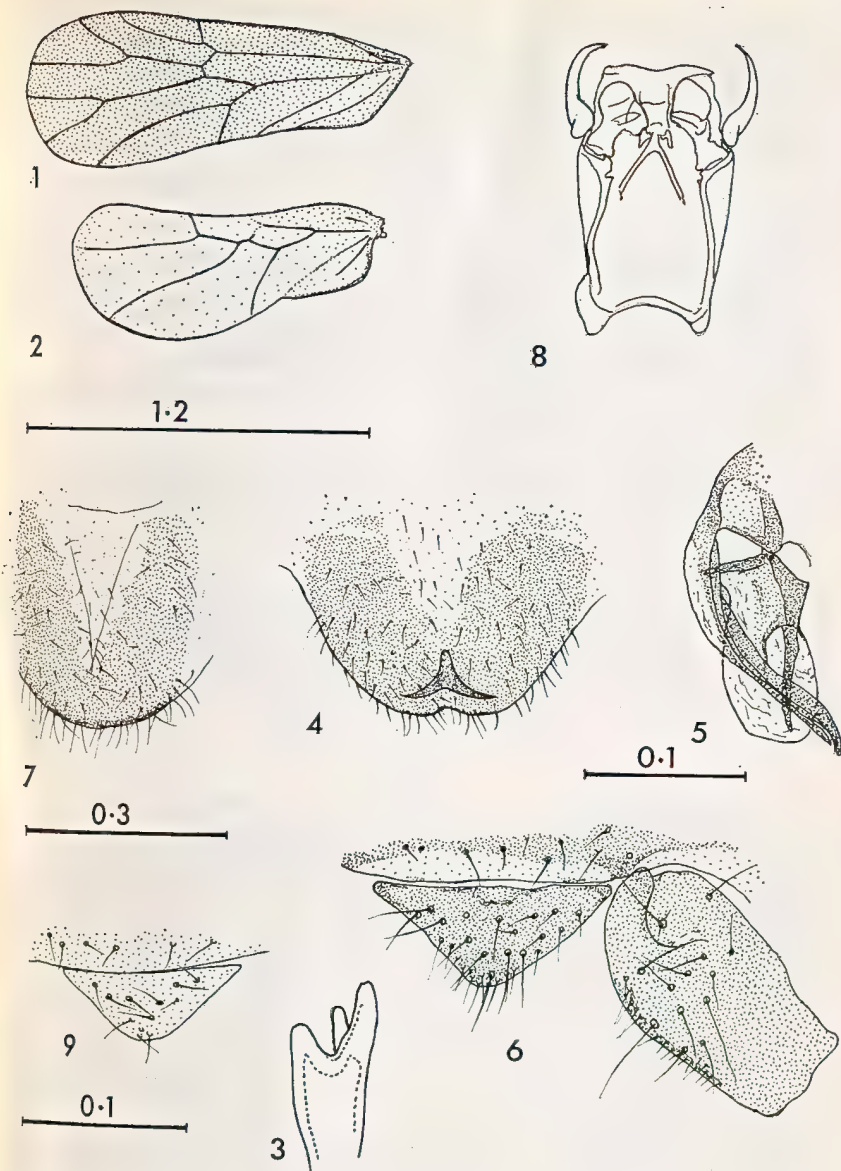
Introduction

Colonial webs of the widely-distributed Dictynid spider *Ixeuticus candidus* (Koch) (for synonymy see Main, 1971) are conspicuous objects in trees in western Victoria, and range in size from a few cm to more than 30 cm in diameter. During a survey of the composition and inhabitants of these webs, all arthropods found within the web area of a series of some 60 colonies were enumerated. These colonies were collected around Sheep Hills and to the south and west of Lake Hindmarsh on 22nd August 1973, and were transported to the laboratory in individual polythene bags. Each was then examined directly by separating into small pieces over a tray, and was subsequently treated in a Tullgren funnel. Samples of unwebbed foliage from the nest-trees were similarly treated. A full account of the arthropod associations found will be published elsewhere. The purpose of this note is to describe an unusual new species of Pachytroctidae found abundantly in some colonies. Notes on the other Psocoptera found are also given.

***Tapinella candida* sp.n.**

FEMALE. *Coloration* (in alcohol). Macropterous form; greyish brown. Head very dark, almost black. Eyes black. Abdomen pale greyish brown except for darker genital segments. Antennae, maxillary palpi and legs pale. Fore-wing an even pale grey, except for paler area in cell Cu_2 . Hindwing paler. Apterous form: similar, but overall rather paler.

Morphology. Three large ocelli in macropterous form, absent in apterous form. Lacinial apex as in fig. 3. Forewing (fig. 1) with Sc_2 and R_1 arising from a common peduncle; radial fork basal to medial fork; areola postica long, with Cu_{1a} tapering gradually towards wing margin. Hindwing (fig. 2) very broad, with R_1 partially present and forming a small, partially evanescent, basal cell. Claws symmetrical. Subgenital plate (fig. 4) emarginate medially; T-sclerite with short thickened base, posterior arms short, tapering and curved. Gonapophyses (fig. 5) with dorsal and ventral valves long and bluntly-rounded at apex; external valve broad, rounded and with a sclerotised bar. Epiproct (fig. 6) triangular, with numerous setae. Paraproct (fig. 6) without trichobothria, but a single strong setae in a defined basal field and a group of 4 or 5 strong setae beyond this; short marginal setae.



FIGS 1-9. *Tapinella candida* sp.n. (1-6, ♀; 7-9, ♂). 1. forewing; 2. hindwing; 3. apex of lacinia; 4. subgenital plate; 5. gonapophyses; 6. epiproct and paraproct; 7. hypandrium; 8. phallosome; 9. epiproct. (Scales in mm; 4, 7, 8 to same scale; 6, 9 to same scale; 3 unscaled).

Dimensions (mm). Body length (B) 1.10-1.25; forewing length (FW) 1.29; hindwing length (HW) 1.10; flagellar segment lengths (f_1 - f_{13}) 0.076, 0.072, 0.057, 0.057, 0.046, 0.049, 0.049, 0.043, 0.049, 0.042, 0.038, 0.038, 0.053; f_1/f_2 1.053; hind femur length (F) 0.315; hind tibia length (T) 0.435; hind tarsal segment lengths (t_1 - t_3) t_1 0.163, t_2 0.049, t_3 0.061; t_1/t_2 3.308; t_2/t_3 0.184.

MALE (apterous). *Colouration* as apterous female.

Morphology. Hypandrium (fig. 7) rounded, with extensive sclerotised area deeply divided anteriorly. Phallosome (fig. 8) complex; broad basally, with slight anterolateral extensions; strong posterolateral hooks, a broad transverse posterior sclerite and narrow internal posterior arms. Epiproct (fig. 9) triangular; border of ninth tergite not produced.

Dimensions. B 1.10; f_1 0.072; f_2 0.070; f_1/f_2 1.030; F 0.310; T 0.435; t_1 0.160; t_2 0.052; t_3 0.058; t_1/t_2 3.077; t_2/t_3 0.897.

HOLOTYPE. Macropterous ♀, AUSTRALIA, VICTORIA, southern side of Lake Hindmarsh, from old nest of *Ixeuticus candidus* on *Acacia pycnantha* 22. viii. 1973, T. R. New, A. L. Yen and J. D. Blyth.

PARATYPES. 5 ♂♂, 14 macropterous ♀♀, 6 apterous ♀♀, same locality, date, and collectors, from nests on *A. pycnantha*, *A. botrycephala*, *Eucalyptus largiflorens* and *Casuarina luehmannii*. Holotype and three paratypes of each sex and morph to be deposited in the Australian Museum, Sydney.

Comments

This, apparently the first species of *Tapinella* Enderlein to be recorded from Australia, is placed in this genus on possessing a T-sclerite in the subgenital plate, although the hindwing venation suggests some affinity with *Pachytroctes* Enderlein. Both genera are widely distributed in the warmer areas of the world and their characters appear to intergrade in some described species. Within *Tapinella*, *candida* is readily separable on colouration from such species as *castanea* Pearman (?Africa), *pictipenna* Thornton, Lee and Chui (Micronesia), *francesca* Thornton and Woo (Galapagos) and *madagascariensis* Badonnel (Madagascar), as well as in genitalic characters from those of the above species which have been fully described. It differs from *T. curvata* Badonnel (Africa) in the form of the male epiproct and in the phallosome bearing anterolateral expansions, and the shape of the subgenital plate and T-sclerite differentiate it from *T. squamosa* Badonnel (Africa). In colouration, *candida* is apparently most similar to *T. formosana* Enderlein (Asia, Pacific region), but the venation differs considerably. Indeed, the joint peduncle to Sc_2 and R_1 in the forewing is itself unusual in the genus, and the forewing venation most resembles that of a Madagascan specimen of *Pachytroctes enigmaticus* Badonnel figured by Badonnel (1967). The latter species, however, lacks the T-sclerite in the subgenital plate and is clearly excluded from *Tapinella*.

Notes on other Psocoptera

The Psocoptera extracted from the spider colonies are listed in Table 1; in all, 28 separate colonies yielded 733 psocids representing 10 species. Several of these are clearly not closely associated with spider nests. Thus the *Caecilius* nymph is of a species (undescribed) common on living foliage in many parts of Victoria, and *Peripsocus maoricus* (Tillyard) is typically a bark-frequenting psocid. Both were found also on foliage samples from the nest-trees. The single *Aaroniella* represents a species not known elsewhere, but its description is deferred until a fuller treatment of the family is possible. The widely-distributed *Ectopsocus briggsi* McLachlan has been recorded from such habitats as squirrel drays and bird nests in Europe, and is more commonly associated with dead foliage. *E. spiculatus* New was amongst the most abundant psocids found, and no clear habitat data have previously been available for this species. It was confined to larger old nests, which incorporated amounts of dead foliage and debris. The type series was predominantly from suction trap samples (New, 1973), indicating that the species may disperse actively and exploit such temporary situations as old nests. In this respect it may resemble the cosmopolitan species *Lachesilla pedicularia* (L); although the latter occurs in Victoria, it is by no means common, and may be partially replaced by *E. spiculatus*. Most adults of *spiculatus* were very strongly brachypterous, the forewings being reduced to small lobes, and brachypterous offspring are often produced by *L. pedicularia* following colonisation by winged forms. *T. candida* appears to be ecologically similar to *E. spiculatus*. The two species were found together in seven old colonies, and may both prove to be opportunistic colonisers. *Liposcelis* were also found in four of these colonies. Three species are represented, two close to *subfuscus* Broadhead and the third similar to

TABLE I

PSOCOPTERA COLLECTED FROM COLONIAL WEBS OF *IXEUTICUS CANDIDUS* FROM WESTERN VICTORIA, AUGUST, 1973

Species	Number Total Adults	No nests present	Tree species*	Sex ratio (♂:♀)
Trogiidae				
<i>Lepinotus patruelis</i> Pearman	3	3	1 C	0:3
Liposcelidae				
<i>Liposcelis</i> (3 spp.)	111	43	7 C,D,E,F	2:41
Pachytroctidae				
<i>Tapinella candida</i> sp.n.	302	26	11 A,C,D,F	5:21
Caeciliidae				
<i>Caecilius</i> sp.	1	0	1 A	
Ectopsocidae				
<i>Ectopsocus briggsi</i> McLachlan	37	4	5 B,D,F	0:4
<i>E. spiculatus</i> New	255	37	9 B,D,F	0:37
Peripsocidae				
<i>Peripsocus maoricus</i> (Tillyard)	3	23	3 A	0:2
Philotarsidae				
<i>Aaroniella</i> sp.	1	1	1 A	0:1

* A, *Casuarina luehmannii* R. T. BakerB, *Acacia trineura* F. Muell.C, *A. pycnantha* Benth. in Hook.D, *A. botrycephala* (Vent.) Desf.E, *A. brachybotrya* Benth. in Hook.F, *Eucalyptus largiflorens* F. Muell.

liparus Broadhead, both of which have been found in birds nests in Europe (Włodarczyk & Martini, 1969). *Lepinotus* occurs in a wide range of domestic and litter situations.

Many of the older nests contained several hundred arthropods, including large numbers of thrips, mites, Anthocoridae, *Ixeuticus* and Clubionid spiders. It is possible that these latter may utilise psocids as a constituent of their prey, but further work is necessary to confirm this. In general, few psocids were found in younger colonies, and the most abundant species were not found elsewhere on the trees. The high proportion of juveniles is itself evidence of successful exploitation of this unusual habitat.

Acknowledgement

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References

- Badonnel, A., 1967. *Faune de Madagascar*. XXIII. Psocoptères, 236 pp. Paris.
- Main, B. Y., 1971. The common 'colonial' spider *Ixeuticus candidus* (Koch) and its synonyms (Dictynidae: Araneae). *J.R. Soc. West. Aust.* 54: 119-120.
- New, T. R., 1973. Two new Victorian species of *Ectopsocus* McLachlan (Psocoptera: Ectopsocidae). *J. Aust. ent. Soc.* 12: 347-351.
- Włodarczyk, J. and Martini, J., 1969. (An attempt at analysis of the occupation of birds nests by Psocoptera). *Ekol. Polsk.* B. 15: 223-336 (in Polish. English summary).

A NATIVE FOOD PLANT OF *PAPILIO CANOPUS CANOPUS* WESTWOOD (LEPIDOPTERA: PAPILIONIDAE)

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Common and Waterhouse (1972) state that the native food plants of *P. canopus canopus* have not been recorded. The life history has been described from cultivated *Citrus* (Rutaceae) at Kununurra on the Ord River and at Darwin.

In November 1973, I observed a specimen of *P. canopus* ovipositing on the leaves of *Micromelum minutum* (Rutaceae), a small tree common within rain forest areas around Darwin. During November and December 1973, I collected many ova and larvae on *M. minutum* which were bred through to adult *Papilio canopus canopus*.

Dr I. F. B. Common (pers. comm.) has also taken larvae of *P. canopus* on *M. minutum* in rain forest at East Point, Darwin, in November 1972.

The ova are laid singly, usually on the leaves (either side) and occasionally on the stems. They are spherical, smooth and very pale yellow, hatching within one week. On small trees of *M. minutum* larvae cause extensive damage.

Acknowledgement

Thanks are extended to Madeleine Parker, Scientific Services, Botany Section, Darwin for identification of the food plant.

Reference

- Common, I. F. B. and Waterhouse, D. F., 1972. *Butterflies of Australia*. Angus & Robertson, Sydney. 4to. Pp. i-xii, 1-498, illustr.